

ADDITIONS TO THE FLORA OF SONORA, MEXICO

THOMAS R. VAN DEVENDER

Sky Island Alliance
300 E. University Blvd., Suite 270
Tucson, Arizona 85705
vandevender@skyislandalliance.org

ANA LILIA REINA-GUERERRO

Sky Island Alliance
300 E. University Blvd., Suite 270
Tucson, Arizona 85705
and
University of Arizona Herbarium
P.O. Box 210036
Tucson, Arizona 85721

AARON D. FLESCH

School of Natural Resources and the Environment
University of Arizona, 325 Bioscience East
Tucson, Arizona 85721

SKY JACOBS

P.O. Box 508
Tucson, Arizona 85702

MICHAEL F. WILSON

Drylands Institute
2509 N. Campbell Ave. #405
Tucson, Arizona 85719

ABSTRACT

Thirty-eight plant taxa are reported for Sonora, Mexico, for the first time. Specimens, observations, and images are deposited in herbaria and are available in the SEINet and MABA online databases.

In 2010, Molina-Freaner and Van Devender published *Diversidad Biológica de Sonora*, which summarized the state of knowledge of all major plant and animal groups in Sonora, Mexico. In the chapter on vascular plants, Van Devender et al. (2010) included a list of the flora of the state of Sonora as an appendix. Since then Van Devender and Reina-G. have maintained and updated the state flora list. The Southwest Environmental Information Network (SEINet 2014) is the primary source of herbarium collections from the southwestern USA and northwestern Mexico. Coverage in Mexico is not as comprehensive because the first SEINet efforts were focused on Arizona collections. Data reported here help to fill this information gap.

The Madrean Archipelago Biodiversity Assessment (MABA) program at Sky Island Alliance was started in 2009. This program documents the distributions of all species of plants and animals in the Sky Island Region, especially in Sonora, Mexico. Information comes from historical sources (herbaria, museums, publications, field notes, etc.) and new field collections, observations, and images). Van Devender and Reina-G. were the principal botanists on MABA Expeditions (Sierras Aconchi, Bacadéhuachi, la Huérfana [=Mazatán], la Madera, San Antonio, San Luis, la Púrica, and el Tigre) to document plants and animals in eight isolated Sky Island mountain ranges and numerous smaller inventories of other areas in Sonora. Flesch and Jacobs observed plants as part of breeding

bird inventories in 26 Sky Island mountain ranges and the northernmost Sierra Madre Occidental (Flesch 2014). All of these biological observations and related images are publically available in the MABA database (www.madreal.org). The FLORA part of the database is directly linked to SEINet.

Here we report 38 new plant taxa for the flora of Sonora. Additional significances are added to individual accounts. Specimens identified by specialists are acknowledged; others were determined by the collectors. Most of these range extensions are documented by herbarium specimens, but others are observations and/or photovouchers in the MABA database or SEINet General Observation. Non-native species are indicated with an “*”.

SPECIES RECORDS

Amaranthus torreyi (A. Gray) A. Gray ex S. Wats. (Amaranthaceae). MEXICO. Sonora. Mpio. de Cucurpe: Palm Canyon, 25 km SE of Magdalena on road to Cucurpe, Sierra Cinta de Plata (= Sierra Babisal), 30°28'13" N, 110°48'31" W, 1049 m, 4 Sep 1976, *Van Devender*, and *Miksacek* (ARIZ; det. J.B. Urry [Bowers]). Mpio. de Agua Prieta: Arroyo Gallardo, 8 km E of Agua Prieta on MEX 2, 31°18'56" N, 109°23'11" W, 1320 m, rare annual on rocky slope in Chihuahuan desert scrub, 10 Sep 2002, *Van Devender* 2002-626, *Reina-G.*, *Doan*, *Damrel*, *Liu*, and *Marussich* (ARIZ).

Cymopterus multinervatus (J.M. Coult. & Rose) Tidestrom (Apiaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 58.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'13" N, 108°54'12" W, 1600 m, uncommon perennial herb in plains grassland, 15 May 2010, *Van Devender* 2010-412, *Reina-G.*, and *Roll* (ARIZ, USON).

Asclepias quinquedentata A. Gray (Asclepiadaceae). MEXICO. Sonora. Mpio. de Moctezuma: Rancho San Fernando, 17.7 km (by air) W of Huásabas, 20.6 km (by air) NE of Moctezuma, E side of the Sierra de la Madera, 29°55'43" N, 109°28'54" W, 1490 m, rare perennial herb; flowers reddish, drying purplish, succulent fasciculate roots in oak woodland, 5 Aug 2010, *Reina-G.* 2010-817, *Van Devender*, *Roll*, *Hedgcock*, *Yanes-A.*, and *Jacobs* (ARIZ, USON; det. M. E. Fishbein).

Asclepias uncialis Greene (Asclepiadaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Animas Valley, 2.6 km south of MEX 2 (at ca. 62 km east of Agua Prieta), Cuenca Los Ojos Conservation Area, 31.3025° N -108.890278° W, 1616 m, plains grassland, rare perennial herb; flowers purple, 26 Apr 2009, *Reina-G.* 2009-64, *Van Devender*, *Anderson*, and *Wilder* (ARIZ).

Significance. First records for Sonora and Mexico.

Artemisia dracunculus L. var. **glauc**a (Pall.) Bess. (Asteraceae). MEXICO. Sonora. Mpio. de Agua Prieta: Rancho el Pinito, Arroyo Cajón Bonito, 56.5 km (by air) ESE of Agua Prieta, Cuenca Los Ojos Foundation Conservation Area, Sierra San Luis, 31°11'26" N, 108°56'27" W, 1432 m, very common herbaceous perennial in shady canyon bottom in sycamore-Arizona cypress-oak canyon forest, 23 Sep 2009, *Van Devender* 2009-1469, *Reina-G.*, *Roll*, and *Rose* (ARIZ, TEX); 58 km (by air) ESE of Agua Prieta, 31°12'00" N, 108°56'24" W, 1427 m, abundant herbaceous annual/perennial in disturbed grazed area in riparian vegetation, 25 Sep 2009, *Reina-G.* 2009-1556, and *Van Devender* (ARIZ, MEXU, TEX, USON); above Arroyo Cajón del Diablo, northwestern Sierra San Luis, 2.7 km S of MEX 2 (at 80 km E of Agua Prieta), ca. 66.9 km (by air) E of Agua Prieta, Cuenca Los Ojos Conservation Area, 31°17'33" N, 108°41'56" W, 1766 m, locally common herbaceous perennial, flowers whitish-yellow in *Arctostaphylos-Quercus-Juniperus* chaparral, 29 Sep 2009, *Van Devender* 2009-1729 & 2009-1733, *Reina-G.*, *Schmidt*, and *Turner* (TEX, USON; ARIZ, TEX). All det. B.L. Turner.

Brickellia veronicifolia (Kunth) A. Gray (Asteraceae). MEXICO. Sonora. Mpio. de Agua Prieta: Rancho el Pinito, Arroyo Cajón Bonito, 56.5 km (by air) ESE of Agua Prieta, Cuenca Los Ojos Foundation Conservation Area, Sierra San Luis, 31°11'26" N, 108°56'27" W, 1432 m, uncommon subshrub in sycamore-Arizona cypress-oak canyon forest, 23 Sep 2009, *Van Devender 2009-1426*, *Reina-G.*, *Roll*, and *Rose* (ARIZ, TEX; det. B.L. Turner, 2011).

Cirsium undulatum (Nutt.) Spreng. (Asteraceae). MEXICO. Sonora. Mpio. de Cananea: vicinity of Observatorio Astrofísico "Guillermo Haro", Sierra la Mariquita, 9.4 km (by air) NNW of Cananea, 31°03'16" N, 110°22'57" W, 2422 m, common on hill top in pine-oak forest with *Pinus strobiformis*, flowers lavender, 19 Sep 2010, *Reina-G. 2010-928*, *Van Devender*, *Sánchez-E.*, *Roll*, and *Sartain* (TEX, USON; det. B.L. Turner, 2011). Mpio. de Ímuris: Rancho el Salto, 27.4 km (by air) ESE of Ímuris, Sierra Azul, 30°44'27" N, 110°34'21" W, 2458 m, uncommon herb, flowers purple-lavender in pine forest, antenna area, 4 Oct 2010, *Van Devender 2010-1036*, *Reina-G.*, *Sánchez-E.*, and *Delgado* (TEX; det. B.L. Turner, 2011).

***Cotula australis** (Spreng.) Hook. f. (Asteraceae). MEXICO. Sonora. Mpio. de Ímuris: Rancho Agua Caliente, 17.2 km (by air) N of Ímuris, 30°57'13" N, 110°51'11" W, 975 m, common ground cover with yellow flowers in cottonwood-willow gallery forest, 28 Mar 2010, *Reina-G. 2010-343*, and *Van Devender* (ARIZ, MEXU, TEX, USON; det. B.L. Turner, 2011).

Significance. Native to Australia and New Zealand.

Helianthus arizonensis R.C. Jackson (Asteraceae). MEXICO. Sonora. Mpio. de Agua Prieta: Rancho la Bota, Animas Valley, ca. 57.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Conservation Area, 31°19'19" N, 108°54'18" W, 1590 m, locally abundant herbaceous perennial on disturbed roadside in Plains grassland, 29 Sep 2009, *Van Devender 2009-1740*, *Reina-G.*, *Schmidt*, and *Turner* (ARIZ, MEXU, TEX, USON; det. B.L. Turner).

Hymenopappus lugens Greene (Asteraceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 60.1 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'05" N - 108°52'51" W, 1596 m, locally common perennial herb with yellow disk flowers in *Nolina* plains grassland, 17 May 2010, *Van Devender 2010-505*, *Reina-G.*, and *Roll* (ARIZ, MEXU, NMC, TEX, USON).

Pyrropappus pauciflorus (D. Don) DC. (Asteraceae). MEXICO. Sonora. Mpio. de Cucurpe: Ciénega de Saracachi, Rancho Agua Fría, Río Saracachi, 10.6 km (by air) ENE of Cucurpe, rare herbaceous perennial in grassy area with flowers light yellow in cotton-willow riparian forest and mesquite bosque and desert grassland on slopes, 30°21'35" N - 110°35'53" W, 946 m, 6 Oct 2010, *Van Devender 2010-1127*, *Reina-G.*, *Luna*, and *Reyes* (TEX; det. B.L. Turner).

Ratibida columnifera (Nutt.) Woot. & Standl. (Asteraceae). MEXICO. Sonora. Mpio. de Agua Prieta: Rancho los Ojos Calientes, ca. 49.0 km (by air) ESE of Agua Prieta, Cuenca Los Ojos Foundation property, 31.27833° N - 109.00111° W, 1294 m, cottonwood-willow riparian forest, 28 Sep 2009, *Reina-G. 2009-1655*, *Van Devender*, and *Schmidt* (TEX, USON).

Rorippa curvisiliqua (Hook.) Bessey ex Britt. (Brassicaceae). MEXICO. Sonora. Mpio. de Hermosillo: Old Río Sonora channel, SW side of Hermosillo, 29°03'43" N - 111°01'20" W, 190 m, locally common annual in moist soil above water in gravel quarry, 11 Feb 2014, *Reina-G. 2014-24*, *Van Devender* (ARIZ, DES, MEXU, NMC, MO, USON; det. A. Salywon).

Thelypodium wrightii A. Gray var. ***wrightii*** (Brassicaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ojo Caliente Ciénega, Rancho los Ojos, ca. 50 km (by air) ENE of Agua Prieta, Cuenca Los Ojos Foundation Conservation Area, 31.2833° N -108.989722° W, 1410 meters, large wet ciénega with desert grassland/oak slopes above, uncommon 1.5 m tall perennial herb, flowers whitish, 28 Sep 2009, *Reina-G. 2009-1645, Van Devender, and Bourns* (ARIZ, DES); Rancho El Diablo, Arroyo Cajón Bonito, Cuenca Los Ojos Foundation property, 45.6 km (by air) ESE of Agua Prieta, 31.290833° N -109.044722° W, 1252 m, cottonwood gallery forest, small herb on rock ledge, flowers white, 16 May 2010, *Reina-G. 2010-472, Van Devender, and Roll* (DES); Rancho El Pinito, Arroyo Cajón Bonito, 56.5 km (by air) ESE of Agua Prieta, Cuenca Los Ojos Foundation conservation area, Sierra San Luis, 31.19056° N -108.94083° W, 1432 m, sycamore-Arizona cypress-oak canyon forest, locally uncommon 1.8 m tall herbaceous perennial, flowers white, 23 Sep 2009, *Van Devender 2009-1478, Reina-G., Roll, and Rose* (ARIZ, DES, MEXU, TEX, USON); Rancho El Diablo, Arroyo Cajón Bonito, ca. 45.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Conservation Area, 31.29083° N -109.04472° W, 1250 m, cottonwood-sycamore-willow riparian forest, locally common 2.5 m tall herbaceous perennial; flowers white, 1 Oct 2009, *Van Devender 2009-1801, Reina-G., Schmidt, Turner, and Trinks* (ARIZ, DES, MEXU, TEX, USON); Rancho El Pinito, Cajón Bonito, Sierra San Luis, Cuenca Los Ojos Foundation, 56.5 km (by air) ESE Agua Prieta, 31.19056° N -108.94083° W, 1432 m, rocky stream canyon, riparian forest with *Platanus wrightii* and *Quercus* ssp., desert grassland on slopes, 7 Sep 2009, *Reina-G. 2009-1518, Van Devender, Roll, and Rose* (MABA observation). All det. A. Salywon.

Chenopodium rubrum L. (Chenopodiaceae). MEXICO. Sonora. Mpio. de Agua Prieta: E of Rancho La Bota, Ánimas Valley, 57.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'44" N, 108°53'52" W, 1609 m, common prostrate, reddish, rosette annuals in disturbed soil on flats in plains grassland, 17 May 2010, *Van Devender 2010-500, Reina-G., and Roll* (ARIZ, CAS, MEXU, USON).

Significance. First records for Sonora and Mexico.

Croton lindheimerianus Scheele (Euphorbiaceae). MEXICO. Sonora. Mpio. de Moctezuma: 19.6 km SSE of Moctezuma on road to Tepache (SON 117), 29°38'52" N, 109°35'09" W, 672 m, occasional erect annual in heavily grazed area (abundant in nearby area) on basalt cobble plain with dwarf foothills thornscrub, 19 Oct 2003, *Van Devender 2003-1232, A.L. Reina-G.* (ARIZ, IEB, MEXU, MICH, NMC, TEX, USON; det. P.E. Berry, 2006); 20.5 km SSE of junction with Moctezuma-Huásabas Hwy on road to Tepache (SON 117), 29°38'36" N, 109°34'32" W, 689 m, solitary small annual plant in basalt cobble plain with sparse open foothills thornscrub, solitary small annual plant in basalt cobble plain with sparse open foothills thornscrub, 26 Apr 2004, *Van Devender 2004-402, Reina-G., Doan, Ferguson, Liu, Anderson, and Johnson* (IEB); 28.1 km SSE of Moctezuma on road to Tepache (SON 117), 29°38'19" N, 109°33'52" W, 696 m, solitary large annual at edge of pavement in basalt cobble plain with dwarf foothills thornscrub, 14 Aug 2006, *Reina-G. 2006-540, and Van Devender* (ARIZ, CAS, HCIB, IEB, MICH, MEXU, MO, TEX, US, USON).

Significance. First records for Sonora and Mexico. Disjunct population of a Chihuahuan Desert species.

Dalea enneandra Nutt. (Fabaceae). MEXICO. Sonora. Mpio. de Sahuaripa: 25.3 km (by air) NNE of Sahuaripa, 29°15'45" N, 109°07'53" W, 774 m, locally common erect herb, flowers blue, 1 Sep 2009, *Van Devender 2009-613, Reina-G., Minter, Hinojo-Hinojo, Delgado-Z., and Gómez* (ARIZ, CAS, HCIB, MEXU, MO, NMC, TEX, US, USON; det. M. McMahon, 2010); 36 km (by air) NNE of Sahuaripa, Reserva del Jaguar del Norte, 29°23'32" N, 109°08'01" W, 800 m, uncommon erect herbaceous perennial, flowers blue, 1 Sep 2009, *Van Devender 2009-708, Reina-G., Minter, Hinojo-Hinojo, Delgado-Zamora, Gómez-R., and Ramírez* (ARIZ, MEXU, USON). All det. S. McMahon.

Significance. Disjunct population of a Chihuahuan Desert species.

Desmanthus pumilus (Schltdl.) J.F. Macbr. var. *pumilus* (Fabaceae). MEXICO. Sonora. Mpio. de Bacadéhuachi: SE edge of Bacadéhuachi, 29°47'49" N, 109°08'11" W, 692 m, rare prostrate herbaceous perennial with white flowers on disturbed roadside in riparian area in foothills thornscrub, 23 Jul 2008, *Van Devender 2008-305*, *Reina-G.*, and *Loyola-R.* (ARIZ, MEXU, MO, NMC, TEX, USON; det. A. Delgado-Salinas). Mpio. de Cananea: 10 km al S de Cananea, carretera a Arizpe, Lat. 30°56' N; 110°16' W, 1340 m, hierba postrada de flores blancas, abundante en pastizal, suelo inundable, 20 May 1987, P. Tenorio-L. 13573 (MEXU).

Lupinus argenteus Pursh (Fabaceae). MEXICO. Sonora. Mpio. de Bacadéhuachi: Sierra Bacadéhuachi, upper Arroyo El Chorro, 1.8-2.5 km (air) NNE Cerro La Placa, on ridgetop locally called Pico de La Cruz (at 11.5 km E and 6 km N Bacadéhuachi), "espuela" fide A. Valencia-Cordova, 29.85833° N -109.025° W, 2300 m, rocky rhyolite soil, N, W, and SW slopes, 10 Dec 1995, *Ferguson 834*, *M. Kaib*, *Mata-Mangueros*, and *Valencia-Cordova* (ARIZ; det. M. Fishbein).

***Prosopis glandulosa** Torr. var. *glandulosa* (Fabaceae). MEXICO. Sonora. Mpio. de Agua Prieta: W base of Sierra San Luis, canyon south of MEX 2, 70.6 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'17" N, 108°46'43" W, 1750 m, solitary 2.0 m tall shrub on roadside in oak woodland, 17 May 2010, *Van Devender 2010-488*, *Reina-G.*, and *Roll* (ARIZ, ASU, HCIB, MEXU, MO, NMC, TEX, US, USON).

Significance. A Texas variety likely spread from cattle trucks along MEX 2.

Sophora nuttalliana B.L. Turner (Fabaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 68.9 km E of Agua Prieta on MEX 2, Cuenca Los Ojos Conservation Area, 31°19'26" N, 108°56'03" W, 1599 m, herbaceous perennial in dense patch growing through asphalt on edge of highway in plains grassland, flowers whitish, calyx bluish, 1 May 2008, *Van Devender 2008-83*, and *Reina-G.* (ARIZ, ASU, HCIB, MEXU, MO, NMC, OJOS, TEX, USON; det. R. Spellenberg); just south of New Mexico border, W side Ánimas Valley, 54.2 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'49" N, 108°57'25" W, 1613 m, locally common perennial herb under 'Normandy barriers' on border and in nearby drainage in plains grassland, flowers white with bluish cast to buds, 19 May 2010, *Van Devender 2010-565*, and *Reina-G.* (ARIZ, TEX, USON). Mpio. de Naco: 13.3 km (by air) SSE of Naco, along MEX 2, 31.210278° N -109.8925° W, 1520 m, single large patch on roadside; flowers white with bluish tint to buds in desert grassland, 21 May 2010, *Van Devender 2010-607*, and *Reina-G.* (ARIZ, CAS, HCIB, MEXU, MO, TEX, USON).

Quercus sideroxyla Bonpl. (Fagaceae). MEXICO. Sonora. Mpio. de Nácori Chico, Pico de la India, 4.6 km (by air) S of Mesa Tres Ríos, 29.80234° N -108.70709° W, 2302 m, pine-oak forest, 18 Jun 2012, *Flesch*, *Valenzuela-A.*, and *González-S.*; Pico de la India, 12.4 km (by air) SSE of Mesa Tres Ríos, 29.73523° N -108.68379° W, 2363 m, pine-oak forest, 19 Jun 2012 *Flesch*, *Valenzuela-A.*, and *González-S.*; Pico de la India, 11.0 km (by air) S of Mesa Tres Ríos, 29.75126° N 29.75126° W, -108.68777° W, 2224 m, pine-oak forest, 19 Jun 12, *Flesch*, *Valenzuela-A.*, and *González-S.*; Sierra el Macho, above Pinos Altos, 9.7 km (by air) WSW of Mesa Tres Ríos, 29.78719° N -108.79998° W, 2121 m, pine-oak forest, 30 Jun 2012, SSE of Mesa Tres Ríos, 29.73523° N -108.68379° W, 2363 m, pine-oak forest, 19 Jun 2012, *Flesch*, *Valenzuela-A.*, and *González-S.* (all MABA observations/photos; ver. G.M. Ferguson, R. Spellenberg).

Veratrum californicum Durand (Liliaceae). MEXICO. Sonora. Mpio. de Huachinera: near Cebadilla on road from Huachinera to Mesa Tres Ríos, 27.3 km (by air) SSE Huachinera, Sierra Huachinera, 29°59'34" N, 108°50'20" W, 1388 m, locally abundant perennial herb in meadow in pine-oak forest, 11 Jun 2005, *D. Danforth* (MABA photo; ver. R.S. Felger, R. Spellenberg).

Hexalectris grandiflora (A. Rich. & Gal.) L.O. Williams (Orchidaceae). MEXICO. Sonora. Mpio. de Huachinera: 14.4 km (by air) SSE of Huachinera, Sierra Huachinera, 30.08536° N -108.898° W, 2000-2100 m, pine-oak forest, 3 Aug 2006, *Jacobs and Flesch* (SEINet General Observation photo, ver. R. A. Coleman).

Hexalectris spicata (Walter) Barnhardt var. **arizonica** (S. Watson) Catling & V.S. Engel (Orchidaceae). MEXICO. Sonora. Mpio. de Ures: 11.8 km (by air) NNW of Mazatán, Sierra de Mazatán (= Huérfana), 29.1011° N -110.196389° W, 1420 m, oak woodland, in oak duff among boulders under *Quercus* canopy in partial shade, six flower spikes to 48 cm height, robust, leafless, 2 Oct 2005, *Wilson* (photovouchers: ARIZ, ASU, DES, HCIB, MEXU, TEX, USON, UTEP, det. G.A. Salazar-Chávez).

Hexalectris warnockii Ames & Correll (Orchidaceae). MEXICO. Sonora. Mpio. de Ures: 11.9 km (by air) NNW of Mazatán, Sierra de Mazatán (= Huérfana), 29.10639° N -110.19694° W, 1400 m, oak woodland, in oak duff among boulders on S-facing slope in partial shade, 8 Sep 2008, *Wilson* (photovouchers: ARIZ, ASU, DES, HCIB, MEXU, TEX, USON, UTEP, MABA photos, ver. R. A. Coleman, G.A. Salazar-Chávez).

Malaxis novogaliciana R. González ex McVaugh (Orchidaceae). MEXICO. Sonora. Mpio. de Bacadéhuachi: Rincón de Guadalupe, 16.5 km (by air) ENE of Bacadéhuachi, Arroyo Campo los Padres (Río Riito drainage), Sierra de Bacadéhuachi, 29.8444° N -108.9769° W, 1680 m, rocky canyon and mountainside, 05 Sep 2011, *Reina-G. 2011-632A, Van Devender, Bygott, and Palting* (MEXU, USON; det. G.A. Salazar-Chávez).

Sarcoglottis schaffneri (Rchb. f.) Ames (Orchidaceae). MEXICO. Sonora. Mpio. de Moctezuma: Rancho San Fernando, 17.7 km (by air) W of Huásabas, 20.6 km (by air) NE of Moctezuma, E side of the Sierra de la Madera (= Oposura), 29.9286° N -109.48167° W, 1490 m, rare perennial herb with basal rosette of leaves and succulent fasciculated roots in oak woodland, 5 Aug 2010, *Reina-G. 2010-774A, Van Devender, Yanes-A., Roll, and Jacobs* (MEXU, USON; det. G.A. Salazar-Chávez).

Penstemon fendleri Torr. & A. Gray (Plantaginaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 60.9 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'19" N, 108°53'14" W, 1610 m, rare perennial herb with purple flowers in *Nolina* plains grassland, 15 May 2010, *Van Devender 2010-393, Reina-G., Enderson, and Roll* (ARIZ).

Alopecurus carolinianus Walter (Poaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 60.1 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'27" N, 108°55'28" W, 1644 m, very common annual in dried mud in stock tank in plains grassland, 20 May 2010, *Reina-G. 2010-595, and Van Devender* (ARIZ, MEXU, NMC, USON); just S of New Mexico border, W side Ánimas Valley, 54.2 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'49" N, 108°57'25" W, 1613 m, locally abundant annual in moist soil in shallow drainage in plains grassland, 19 May 2010, *Van Devender 2010-558, and Reina-G.* (ARIZ, CAS, HCIB, MO, TEX, USON, US).

Significance. First records for Sonora and Mexico.

Elymus canadensis L. (Poaceae). MEXICO. Sonora. Mpio. de Agua Prieta: Rancho El Cajón Bonito, 6.3 km southeast of MEX 2 (at 53 km east of Agua Prieta), Cuenca Los Ojos conservation area, 31.2783° N -109.0011° W, 1291 m, cottonwood willow riparian forest, 16 Aug 2007, *Reina-G. 2007-795, and Van Devender* (ARIZ, MEXU, NMC, USON; det. C.G. Reeder); Ciénega Ojo Caliente, Rancho los Ojos, ca. 50 km (by air) ENE of Agua Prieta, Cuenca Los Ojos Foundation conservation

area, 31.2833° N -108.98972° W, 1410 m, large wet ciénega with desert grassland/oak woodland on slopes above, 28 Sep 2009, *Reina-G. 2009-1606*, Van Devender, and Bourns (ARIZ, MEXU, USON); Rancho los Ojos, Cajón Bonito, ca. 49.2 km (by air) ESE of Agua Prieta, 6.3 km SE of MEX 2 (at 53 km E of Agua Prieta), Cuenca Los Ojos Foundation Conservation Area, 31.27833° N -109.0011° W, 1291 m, in sand near stream in cottonwood-willow riparian forest, 30 Sep 2009, *Reina-G. 2009-1758*, Van Devender, Schmidt, and Turner (NMC, US, USON); Rancho el Diablo, 45.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31.29083° N -109.04472° W, 1250 m, canyon bottom, rocky slope in cottonwood-sycamore-willow riparian forest, shrubby desert grassland on slopes, 1 Oct 2009, *Van Devender 2009-1807*, and *Reina-G* (ARIZ, ver. M. Bauer).

****Hordeum vulgare* L. var. *trifurcatum* (Schltdl.) Alef. (Poaceae).** MEXICO. Sonora. Mpio. de Aconchi: Cerro la Huertita, 12.5 km (by air) WSW of Aconchi, Sierra Aconchi, 29°48'18" N, 110°21'12" W, 1860 m, disturbed roadside in open pine-oak forest, 3 Sep 2012, *Van Devender 2012-568*, Hanby, *Reina-G.*, and *Loyola-R.* (ARIZ, USON, det. M. Bauer).

***Stipa neomexicana* (Thurb.) Scribn. (Poaceae).** MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 60.1 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'05" N, 108°52'51" W, 1596 m, occasional perennial in *Nolina* plains grassland, 20 May 2010, *Reina-G. 2010-601*, and *Van Devender* (ARIZ, CAS, HCIB, MEXU, NMC, MO, TEX, USON); just south of New Mexico border, W side Ánimas Valley, 54.2 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'48" N, 108°57'25" W, 1613 m, uncommon perennial on grassy hillside in plains grassland, 19 May 2010, *Van Devender 2010-552*, and *Reina-G.* (ARIZ, MEXU, USON).

***Urochloa panicoides* P. Beauv. (Poaceae).** MEXICO. Sonora. Mpio. de Nacozari de García: Rancho Viejo (part of Rancho el Salto), Arroyo el Schick, 17.2 km (by air) N of Nacozari, Sierra la Purica. 30°31'50" N, -109°43'19" W, 1657 m, locally very common prostrate perennial, rocky canyon in oak woodland, 8 Sep 2013, *T.R. Van Devender 2013-178*, *A.L. Reina-G.*, *Vera Markgraf* (ARIZ, MO; det. G. Davidse).

***Phlox gracilis* (Douglas ex Hook.) Greene (Polemoniaceae).** MEXICO. Sonora. Mpio. de Agua Prieta: E of Rancho La Bota, Ánimas Valley, 57.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'44" N, 108°53'52" W, 1609 m, locally common annual with white flowers in disturbed plains grassland, 17 May 2010, *Van Devender 2010-502*, *Reina-G.*, and *Roll* (ARIZ, MEXU, RSA, TEX, USON); ca. 0.5 mi W of Mababi Ranch, ca. 42 mi W of Rte 19, along turnoff 3.2 mi N of Esqueda, 30.771304° N -109.892021° W, 1270 m, rocky hillside, along stream, 27 Mar 1970, *McGill 6420*, *Pinkava* (ASU, det. E. Lehto)

***Delphinium wootonii* Rydb. (Ranunculaceae).** MEXICO. Sonora. Mpio. de Agua Prieta: Ánimas Valley, 60.9 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'19" N, 108°53'14" W, 1610 m, rare perennial herb with pale lavender flowers in *Nolina* plains grassland, 15 May 2010, *Van Devender 2010-389*, *Reina-G.*, *Roll*, and *Enderson* (HCIB, TEX, USON); E of Rancho La Bota, Ánimas Valley, 57.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'44" N, 108°53'52" W, 1609 m, locally common annual, flower pale lavender in plains grassland, 17 May 2010, *Van Devender 2010-504*, *Reina-G.*, and *Roll* (MEXU, USON) and solitary individual with albino flowers, 17 May 2010, *Van Devender 2010-504A*, *Reina-G.*, and *Roll* (ARIZ); Arroyo Guadalupe, Rancho Puerta Blanca, Cuenca Los Ojos, Foundation property, ca. 41 km E of Agua Prieta on MEX 2, 31°18'57" N, 109°05'35" W, 1295 m, locally common in side canyon with pale lavender flowers in desert grassland, 16 May 2010, *Reina-G. 2010-423*, *Van Devender*, and *Roll* (ARIZ, CAS, MEXU, MO, NMC, USON); just S of New Mexico border, W side Ánimas Valley, 54.2 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°19'49" N,

108°57'25" W, 1613 m, locally uncommon annual with lavender flowers in plains grassland, 19 May 2010, *Van Devender 2010-569*, and *Reina-G.* (ARIZ, US, USON).

Potentilla norvegica L. (Rosaceae). MEXICO. Sonora. Mpio. de Sahuaripa: Rancho El Refugio at Río Áros, Arroyo Las Tésotas, 29°25'02" N, 109°05'01" W, 488 m, rare annual in sand next to river, riparian vegetation with foothills thornscrub on slopes, 30 Mar 2011, *Van Devender 2011-48*, *Reina-G.*, *Duarte-R.*, *Gómez-R.*, *Gutiérrez-G.*, and *Gómez-M.* (ARIZ).

***Ruta graveolens** L. (Rutaceae). MEXICO. Sonora. Mpio. de Nacozari de García: church above Mina El Tigre, 33.1 km (by air) WNW of Bavispe, 46.2 km (by air) ENE of Nacozari de García, Sierra el Tigre, 30°35'22" N, 109°13'07" W, 1831 m, occasional 0.5 m tall herb along trail with strong odor to foliage in oak woodland, established cultivar away from house ruins, 17 Mar 2010, *Reina-G. 2010-171*, *Van Devender*, *Portillo*, *Jimenez-M.*, and *M. Munguía* (ARIZ); Pílares de Téras, 35.8 km (by air) NW of Bavispe, 51.1 km (by air) ENE of Nacozari de García, 30°39'01" N, 109°15'29" W, 1101 m, locally common herb below abandoned houses in riparian vegetation with *Populus monticola*, Sonoran desertscrub on slopes, 21 Mar 2010, *Reina-G. 2010-306*, and *Van Devender* (confiscated by APHIS at border).

ACKNOWLEDGEMENTS

We thank the late John and Charlotte Reeder, Billie L. Turner, Alfonso Delgado-Salinas, and Michael Bauer for identifications of specimens. George M. Ferguson, Jesús Sánchez-Escalante, Erik F. Enderson, and Doug Danforth provided important records. We thank John Anderson, Denise Ávila, David Delgado, Erik Enderson, Ed Gilbert, Miguel Gómez-R., César Hinojo-Hinojo, Beatriz E. Loyola-Reina, Chris Roll, Frank Rose, Jesús Sánchez-E., and Ben Wilder for help with field work. Shelly McMahon, George Ferguson, and Sarah Hunkins in the University of Arizona Herbarium helped process specimens and SEINet records. Field activities were conducted under a SEMARNAT permit to Jesús Sánchez.

LITERATURE CITED

- Flesch, A.D. 2014. Distribution, abundance, habitat, and biogeography of breeding birds in the Sky Islands and adjacent Sierra Madre Occidental of northwest Mexico. Final report to U.S. National Park Service and U.S. Fish and Wildlife Service, CESU Agreement P08AC00077/J1212080048 and FWS Cooperative Agreement F12AP00566. School of Natural Resources and the Environment, Univ. of Arizona, Tucson, and Division of Biological Sciences, Univ. of Montana, Missoula.
- Molina-F., F., and T.R. Van Devender (eds.). *Diversidad Biológica de Sonora*. Univ. Nacional Autónoma de México, Hermosillo.
- SEINET. 2014. Southwest Environmental Information Network. Managed at Arizona State Univ., Tempe. <<http://swbiodiversity.org/seinet/index.php>>
- Van Devender, T.R., R.S. Felger, M. Fishbein, F. Molina-Freaner, J.J. Sánchez-Escalante, and A.L. Reina-Guerrero. 2010. Biodiversidad de las plantas vasculares. Pp. 229-262 in F. Molina-F. and T.R. Van Devender (eds.), *Diversidad Biológica de Sonora*. Univ. Nacional Autónoma de México, Hermosillo.